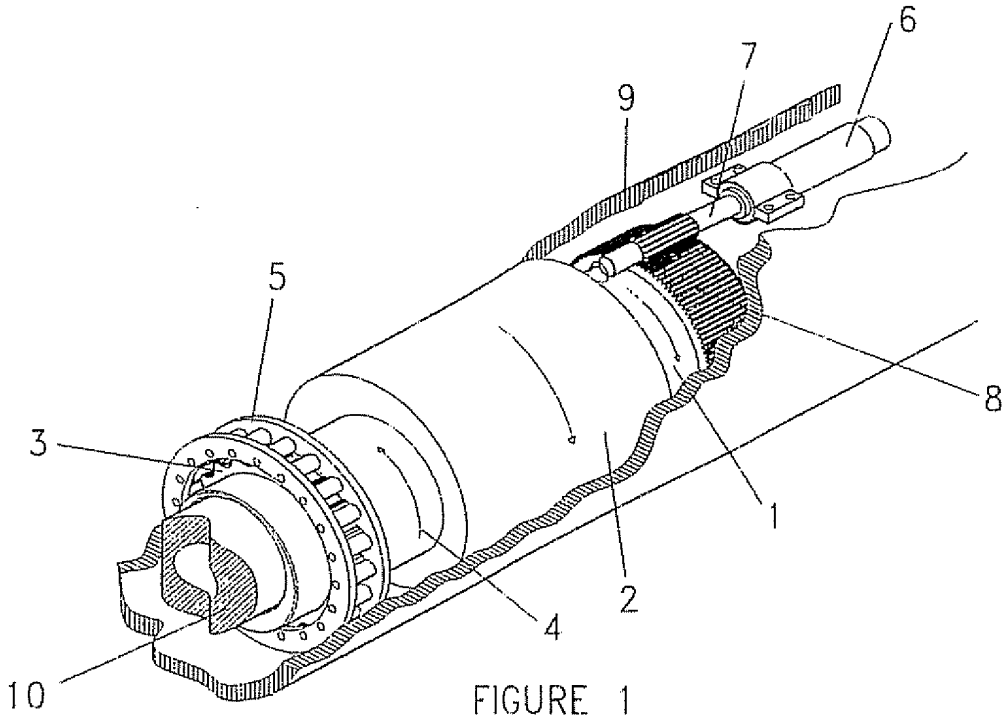

FIGURE 1

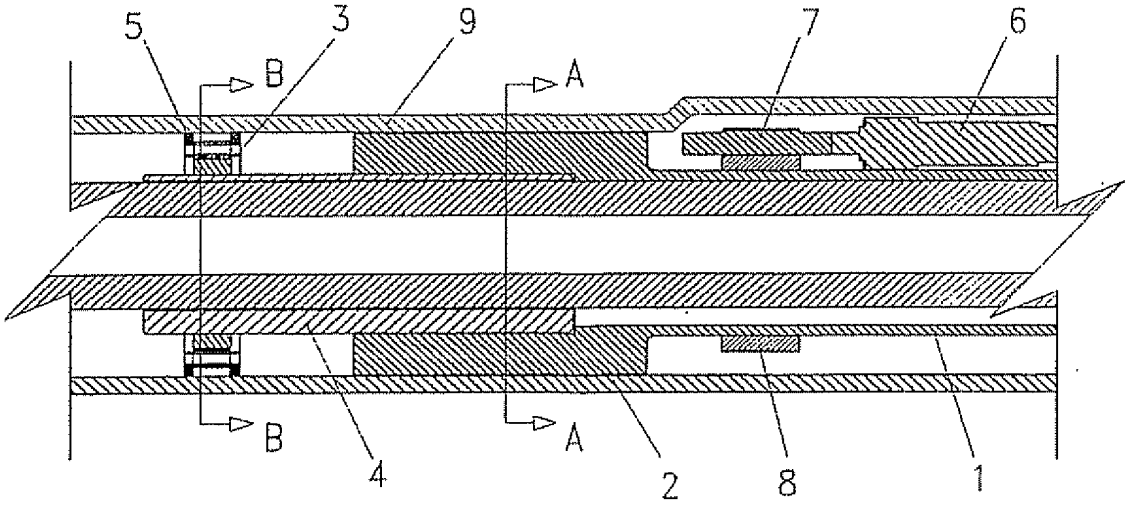

FIGURE 2

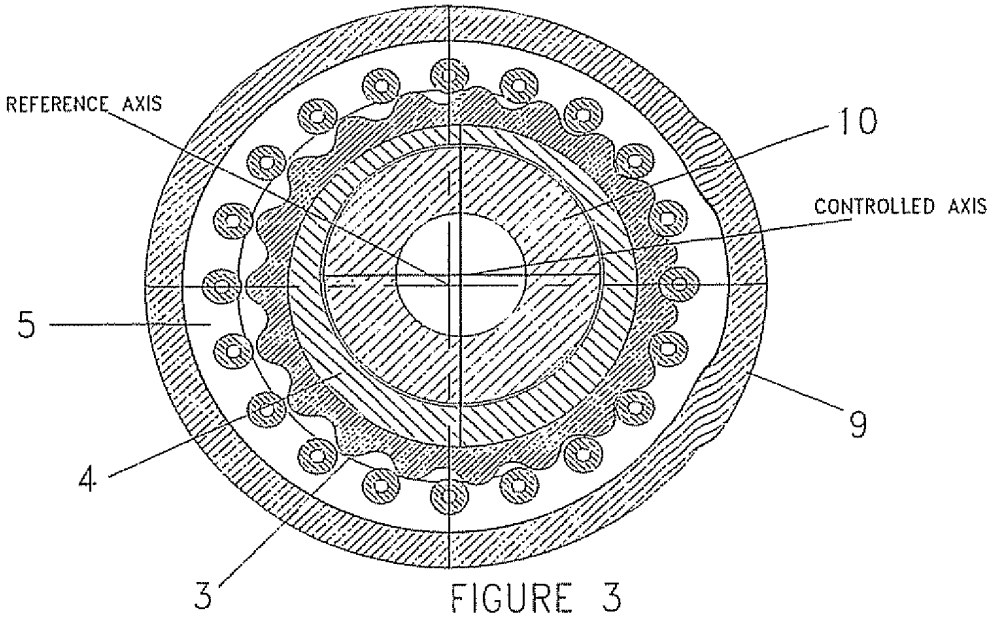

FIGURE 3

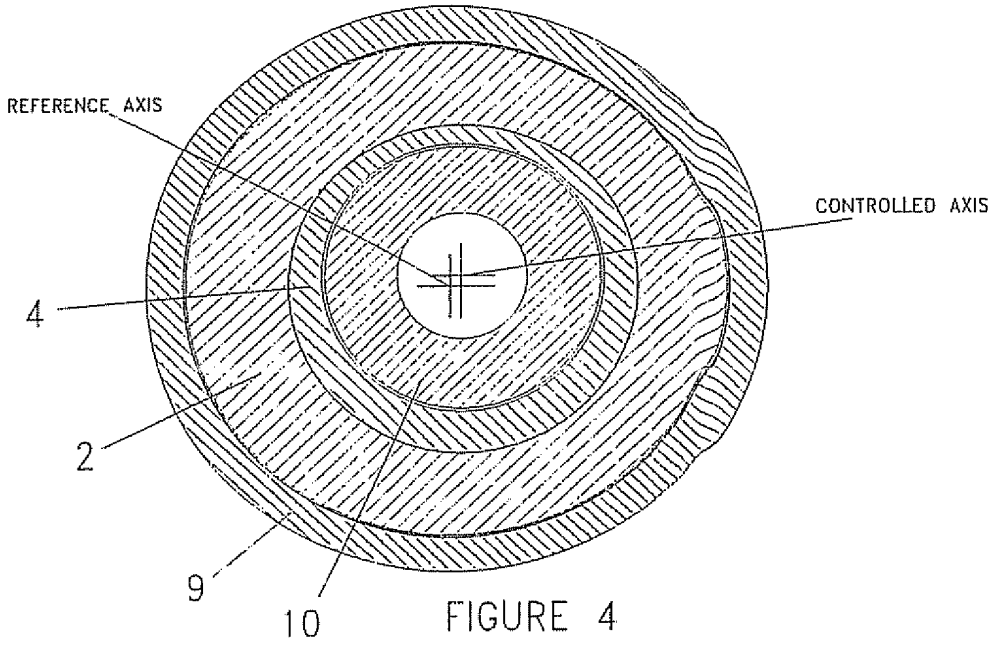

FIGURE 4

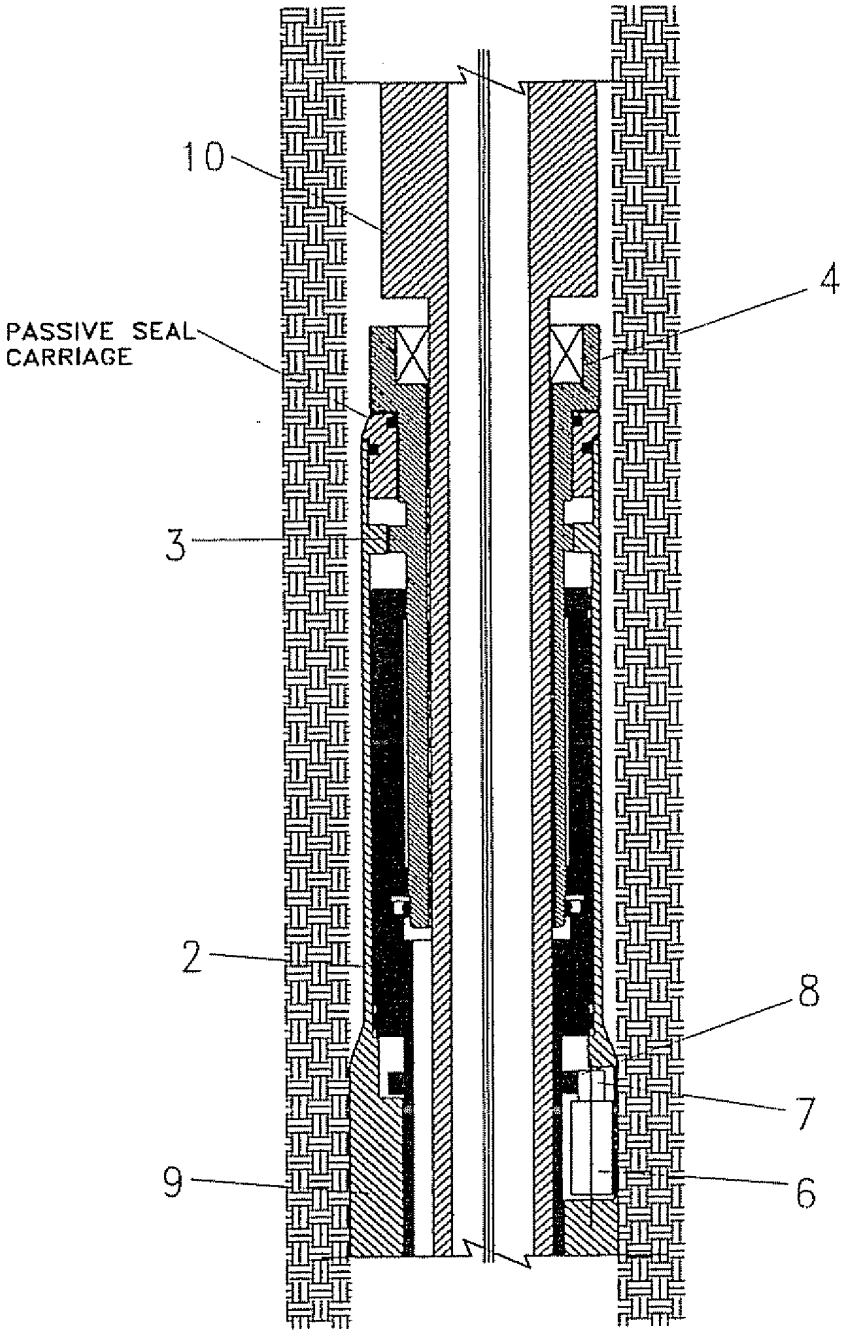

Figure 5

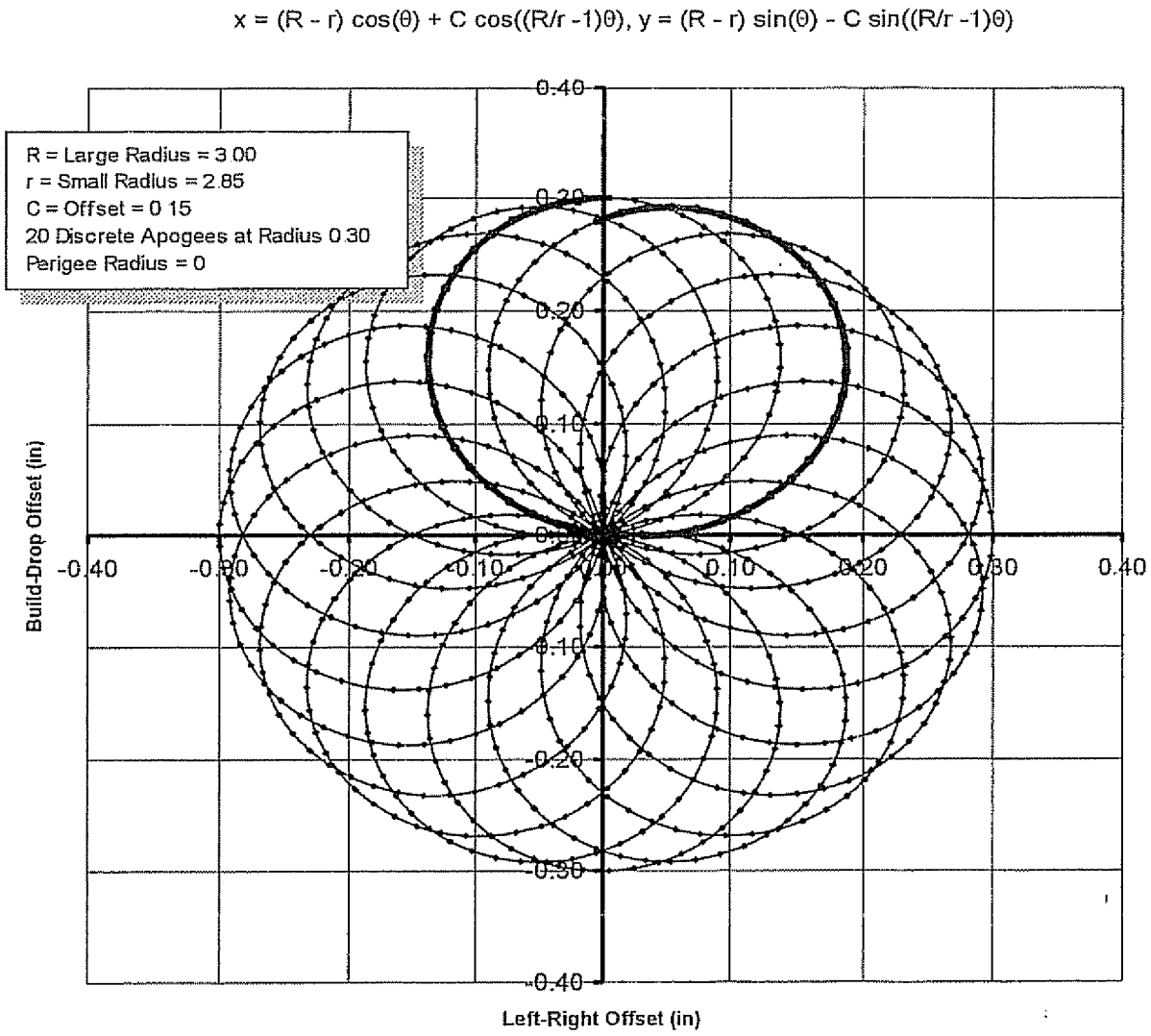
x = (R - r) cos(θ) + C cos((R/r -1)θ), y = (R - r) sin(θ) - C sin((R/r -1)θ)
R = Large Radius = 3.00
r = Small Radius = 2.85
C = Offset = 0.15
20 Discrete Apogees at Radius 0.30
Perigee Radius = 0
Build-Drop Offset (in)
Left-Right Offset (in)
0.40
0.30
0.20
0.10
-0.40
-0.30
-0.20
-0.10
0.10
0.20
0.30
0.40

Figure 6

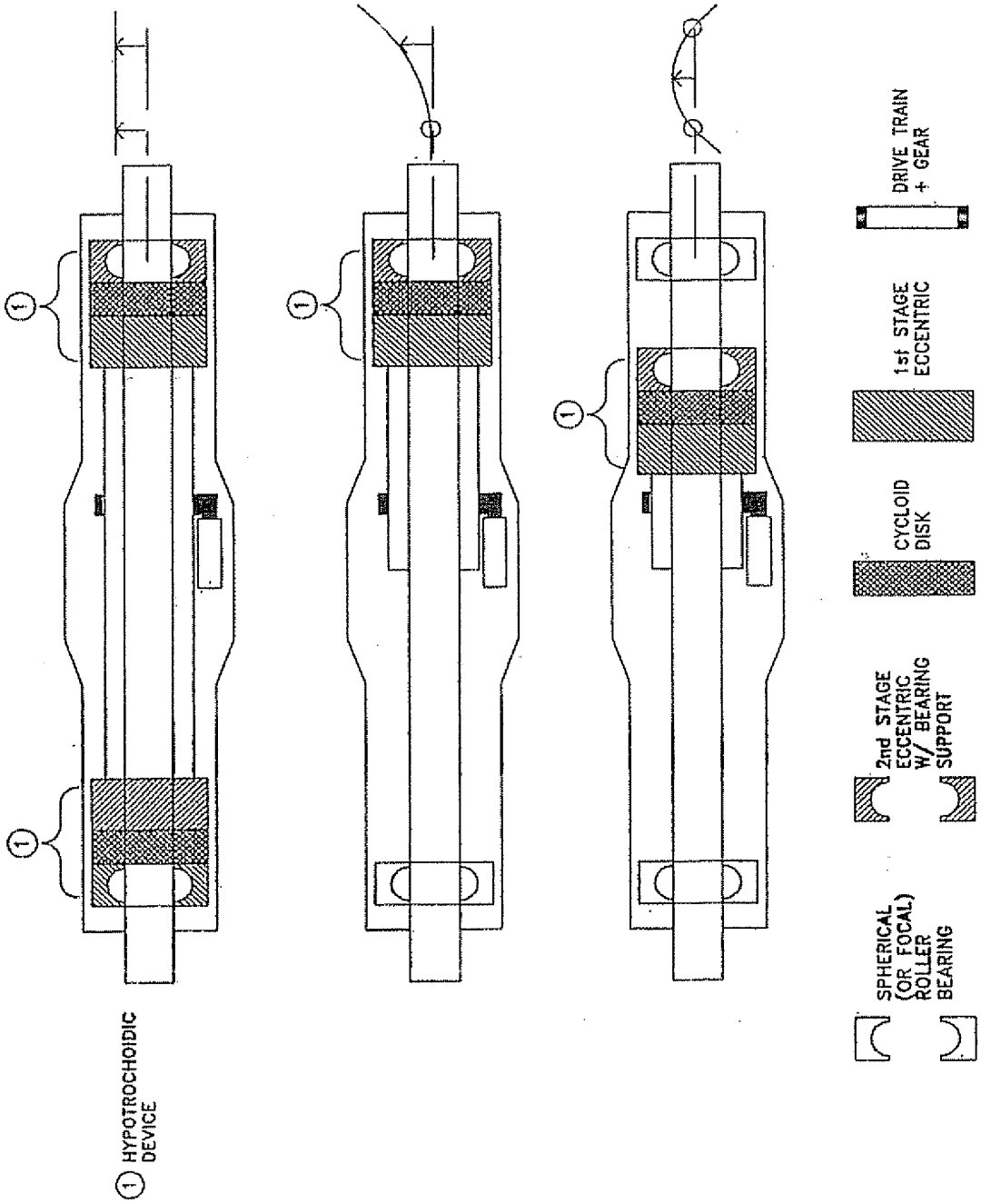

Figure 7A Figure 7B Figure 7C Figure 7F

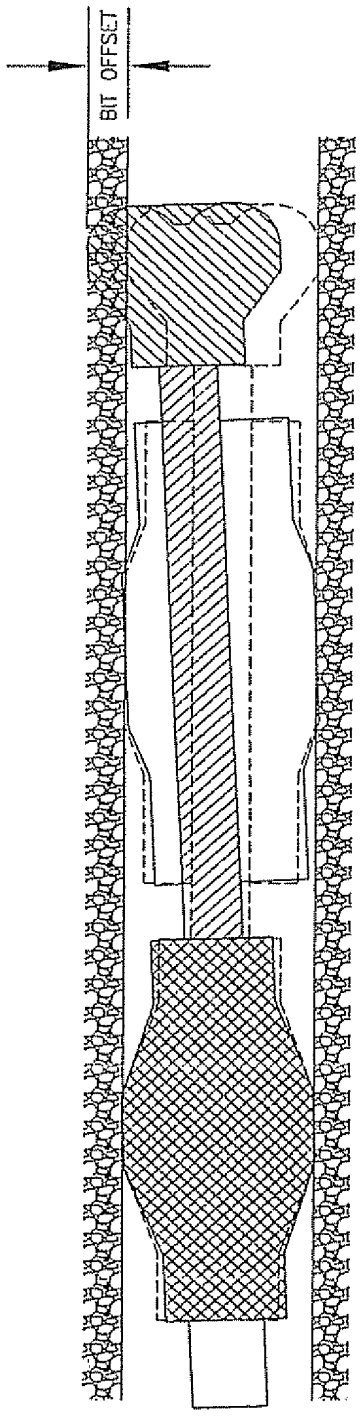

Figure 7D

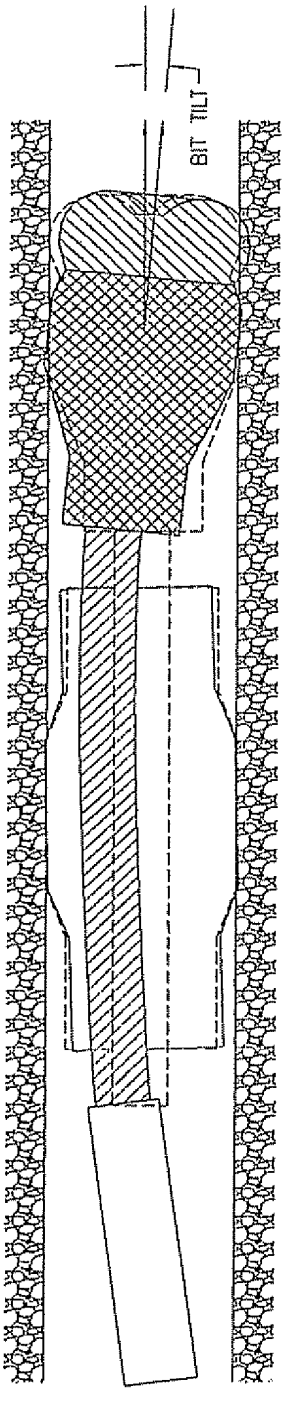

Figure 7E

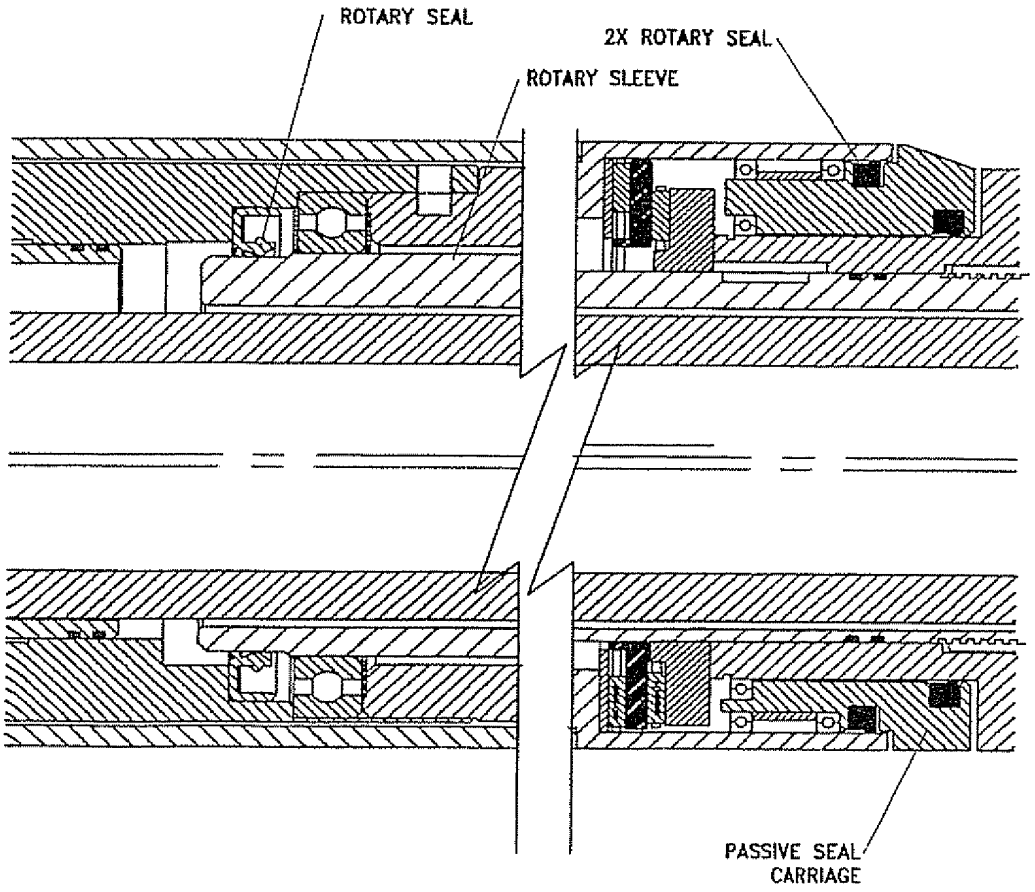
ROTARY SEAL
2X ROTARY SEAL
ROTARY SLEEVE
PASSIVE SEAL
CARRIAGE

Figure 8

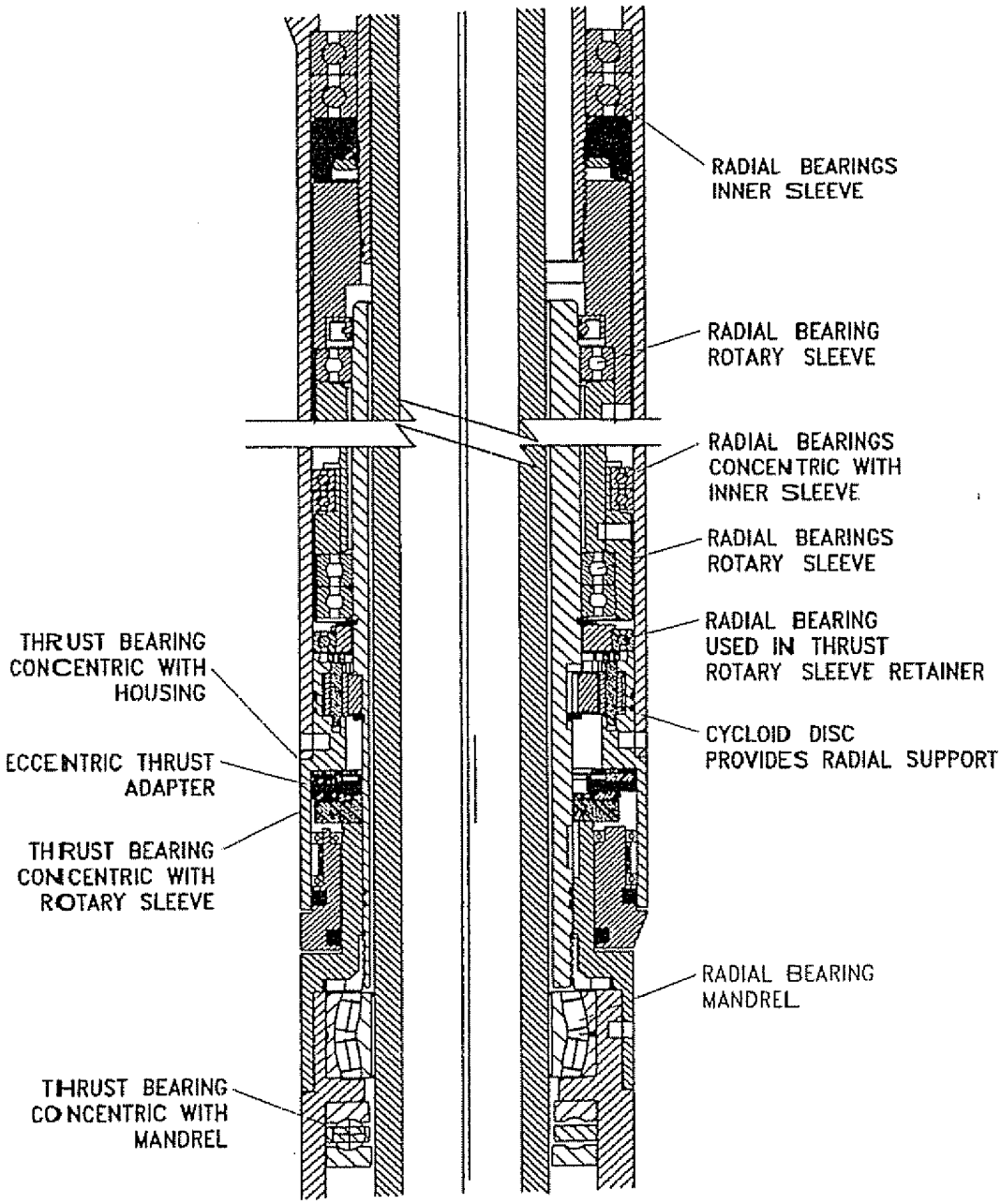
RADIAL BEARINGS INNER SLEEVE
RADIAL BEARING ROTARY SLEEVE
RADIAL BEARINGS CONCENTRIC WITH INNER SLEEVE
RADIAL BEARINGS ROTARY SLEEVE
RADIAL BEARING USED IN THRUST ROTARY SLEEVE RETAINER
CYCLOID DISC PROVIDES RADIAL SUPPORT
THRUST BEARING CONCENTRIC WITH HOUSING
ECCENTRIC THRUST ADAPTER
THRUST BEARING CONCENTRIC WITH ROTARY SLEEVE
RADIAL BEARING MANDREL
THRUST BEARING CONCENTRIC WITH MANDREL

Figure 9

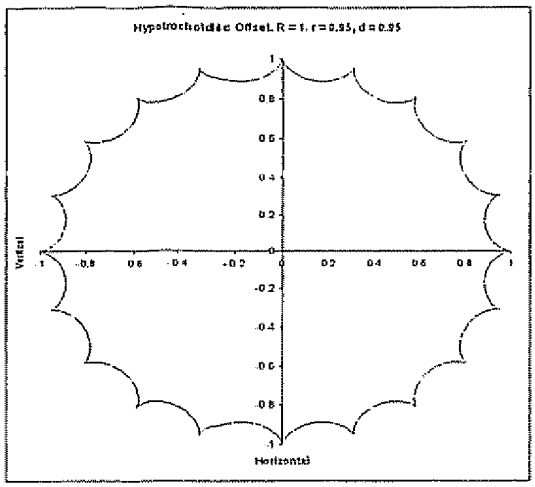

Figure 10A

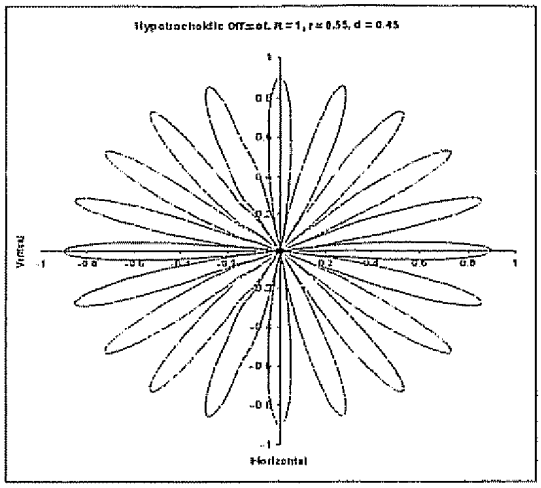

Figure 10B

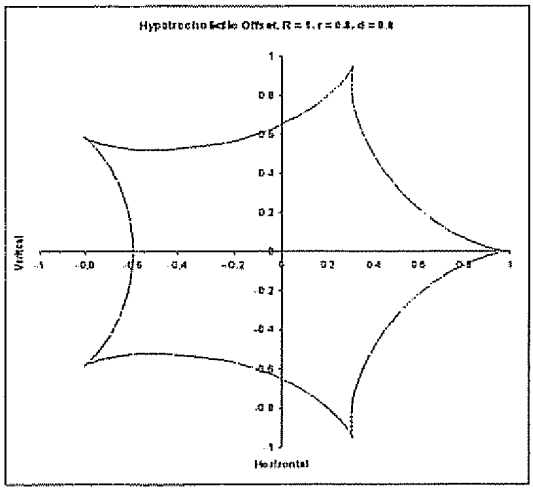

Figure 10C

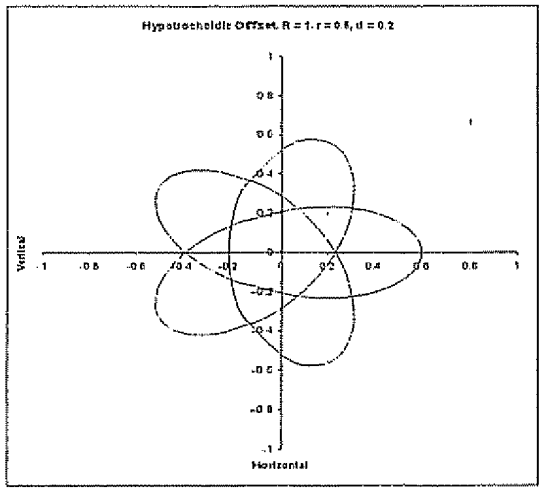

Figure 10D

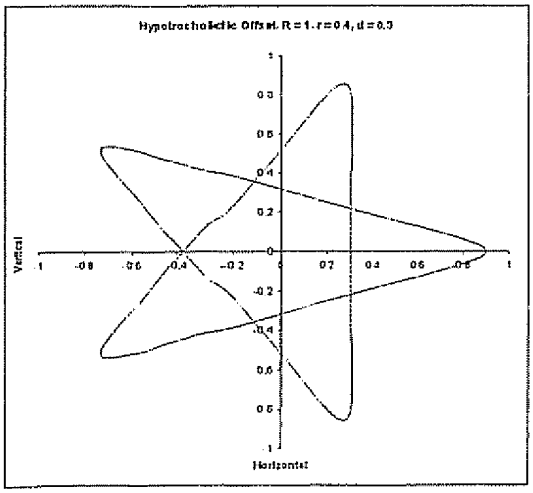

Figure 10E

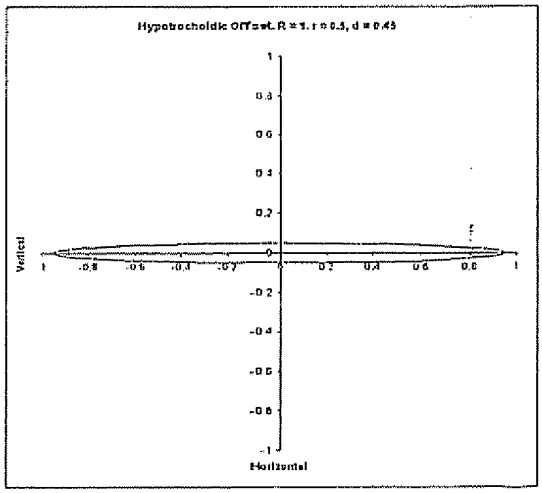

Figure 10F

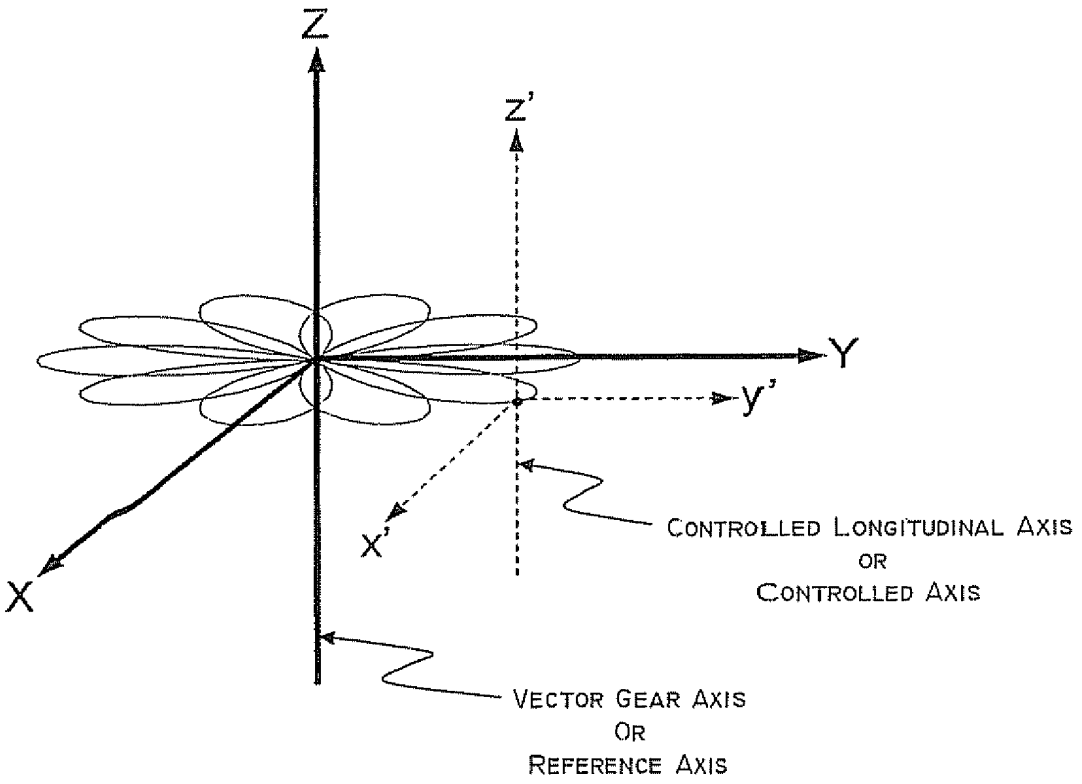
Z
z'
Y
y'
X'
X
CONTROLLED LONGITUDINAL AXIS
OR
CONTROLLED AXIS
VECTOR GEAR AXIS
OR
REFERENCE AXIS

Figure 11